

NAVAL WAR COLLEGE  
Newport, R.I.

Network Centric Coalitions:  
Pull, Pass, or Plug-in?

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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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15 May 1999

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## REPORT DOCUMENTATION PAGE

1. Report Security Classification: UNCLASSIFIED			
2. Security Classification Authority:			
3. Declassification/Downgrading Schedule:			
4. Distribution/Availability of Report: DISTRIBUTION STATEMENT A: APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.			
5. Name of Performing Organization: JOINT MILITARY OPERATIONS DEPARTMENT			
6. Office Symbol: C	7. Address: NAVAL WAR COLLEGE 686 CUSHING ROAD NEWPORT, RI 02841-1207		
8. Title (Include Security Classification): Network Centric Coalitions: Pull, Pass or Plug-in? (u)			
9. Personal Authors: CDR James Carr, USN			
10. Type of Report: FINAL	11. Date of Report: 15 May 1999		
12. Page Count: ■ 24			
13. Supplementary Notation: A paper submitted to the Faculty of the NWC in partial satisfaction of the requirements of the JMO Department. The contents of this paper reflect my own personal views and are not necessarily endorsed by the NWC or the Department of the Navy.			
14. Ten key words that relate to your paper: Network Centric Warfare, Coalitions, Don Starry, Jerry O. Tuttle, JOTS, interoperability, multinational operations, Information Age warfare, doctrinal evolution, theater strategy			
15. Abstract: The author traces the evolution of Network Centric Warfare, showing its American roots. He shows that NCW is not a remote concept on the horizon, it is nascent in today's maritime operations and inevitably will be the way in which the U.S. Navy will fight future wars. Then he reveals a gaping mismatch between the emerging operational doctrine and the strategy it will be tasked to support. Since it is largely an American conception for warfare, the United States thus bears the burden to pursue interoperability with regional coalition partners if it is to fight "together when we can, alone if we must." Finally, the author presents options for addressing this strategic/operational mismatch and proposes a "way ahead."			
16. Distribution / Availability of Abstract: Abstract:	Unclassified X	Same As Rpt	DTIC Users
17. Abstract Security Classification: UNCLASSIFIED			
18. Name of Responsible Individual: CHAIRMAN, JOINT MILITARY OPERATIONS DEPARTMENT			
19. Telephone: 841-6461	20. Office Symbol: C		

## **Abstract.**

For the past several years, *Network Centric Warfare* has dominated debate in American naval professional journals. Perhaps the most hotly debated operational concept since the end of the Cold War, it is touted by its proponents as an emergent, radically different, yet highly relevant concept for the conduct of warfare in the maritime environment. Many proponents argue that it is a Revolution in Military Affairs that dramatically enhances the war fighter's ability to achieve tactical success and translate it to operational objectives. Others assert that it flattens and widens access to a clear picture of the battle space: so much so that it blurs the boundaries between the strategic, the operational and the tactical levels of warfare. Detractors argue that it is much ado about nothing: business as usual with newer technology. Even worse, they contend, it is a sham doctrine which serves as a sop while reducing naval force structure during a time of fiscal restraint.

In this discussion, the author traces the evolution of this emerging doctrine, showing its American roots. He shows that Network Centric Warfare is not a remote concept on the horizon, it is nascent in today's maritime operations and inevitably will be the way in which the U.S. Navy will fight in future wars. Then he reveals a gaping mismatch between the emerging operational doctrine and the strategy it will be tasked to support. Since it is largely an American conception for warfare, the United States thus bears the burden to pursue interoperability with regional coalition partners if it is to fight "together when we can, alone if we must."<sup>1</sup> Finally, the author presents options for addressing this strategic/operational mismatch and proposes a "way ahead."

## **Genesis of Information Age warfare. A brief historical discussion.**

In the 1970's, futurist Alvin Toffler wrote that the most significant feature of modern industrial society was *the rate at which it was changing*. The pace of change was dizzying, bewildering. It created a cultural phenomenon he called "Future Shock." By 1980, he came to the conclusion that we were no longer simply facing change in the

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<sup>1</sup> The White House, National Security Strategy for a New Century, May 1997, p. 1.

Industrial Age, we were in fact witnessing the birth of a new age: the Information Age.<sup>2</sup> Significantly, his views gained the eye of some forward-looking military planners that were casting about for a framework they could use to plot a revised roadmap for the future of U.S. Army operational doctrine.

In a period of demoralized doctrinal hand-wringing that followed the Vietnam War, Army professional journals and doctrinal debate hashed and rehashed “the last war.” What went wrong? How did a profoundly superior, heavily armed, well trained American army with a sound doctrine lose to an operationally inexperienced and ill-equipped Vietnamese army? Don Starry and a handful of visionary U.S. Army planners were eager to put the post-mortems behind them, and get on with productive planning for “the next war.” In their view the enemy at hand was a heavily armored Soviet led force of superior mass, poised to invade through the Fulda Gap. Army doctrine was growing obsolete. These strategists were determined that nothing would be spared a cold hard look: a top to bottom, doctrine to tactics reevaluation. All operational tenets were fair game and open to scrutiny.

These warriors found themselves struck by a most surprising battlefield event. In 1973 Israel won a dramatic battle, defying overwhelming numerical odds in their war with Syria and Egypt. In the Golan Heights, Israeli armored divisions demolished a vastly superior Syrian armored force, which was backed up with substantial reserves. The Israelis, using initiative, surprise, shock, maneuver, and deep penetration achieved spectacular battlefield success against a more heavily massed force.<sup>3</sup> The outcome of this battle defied a commonly accepted relationship among the principles of war: maneuver had soundly defeated superior mass.

This appealed to Don Starry. For a generation, American strategists had known that they must deal with the challenge of protecting Western Europe with an inferior

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<sup>2</sup> Toffler calls the agricultural revolution of 10,000 years ago the “First Wave” of transformational change, the industrial revolution of 300 years ago the “Second Wave” of transformational change, and the information revolution which we are currently experiencing the “Third Wave” of transformational change. He argued for this theory in his 1980 book The Third Wave, which was studied by Don Starry and other forward thinkers who were arguing for a major culture change in U.S. Army doctrine. His impact on these thinkers was profound, and thus his book bears some discussion. Alvin Toffler and Heidi Toffler, War and Anti-War (New York: Warner Books, 1993) p. 8.

<sup>3</sup> The Syrians attacked Israel with 5 divisions of 45,000 troops, 1400 tanks and 1000 pieces of artillery against Israel’s 2 brigades of 6000 troops, 170 tanks and 60 pieces of artillery. Syria lost 1300 tanks, 3500 soldiers KIA, 370 captured. Israel lost 100 tanks, 772 soldiers KIA, 65 captured. Toffler, pp. 53-55.

force. Tank and troop counts were an important measurement of readiness. Conventional American doctrine held that the only compensation for mass was shock—nuclear shock. Americans planned to use the inferior-massed allied forces in Europe to fight a conventional delaying action until mass could be accumulated to shift to the offense. If all else failed, American and allied forces would use tactical nuclear weapons on the battlefield to attrite the enemy and even the odds.

The lessons from the Israeli war highlighted misconceptions within American strategy, and gave the iconoclast Starry the ammunition he needed to change the Army's paradigm. As he succinctly related to Toffler in a meeting to discuss warfare in the Information Age:

*"whoever seizes the initiative, whether he is outnumbered or outnumbering, whether he is attacking or defending, will win . . . We had to delay and disrupt, deep into the enemy's battle area . . . We wouldn't have to destroy them . . . all we really had to do was prevent them from getting into the battle so they couldn't overwhelm the defenders."*<sup>4</sup>

After vigorous cultural and doctrinal debate within the army, Don Starry's fundamental concept for active defense provided the genesis for *AirLand Battle*, and the refinements that followed.

AirLand Battle marked a dramatic shift in the way the U.S. Army thought about war, and the shift did not come easily. It required a culture change. A generation of skeptical Army leadership had to pass through the ranks. Time, and synchronicity, replaced mass as the centerpiece for the strategy. Dominant maneuver, and precise concentration of shock at specific vulnerabilities would achieve tactical success. Tactical success could be translated to operational success if the operational commander could quickly assess the "real-time truth" on the battlefield and focus firepower at precisely the right spot as soon as a vulnerability presented itself. By striking deeply, swiftly and accurately, confusing the enemy and depriving him of the initiative, operational commanders could achieve victory by controlling the *tempo of the fight*. Fundamental enablers for such a strategy would be speed, long range and precision fire, real time mapping and targeting, and communication. The United States needed more satellites, not just more tanks.

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<sup>4</sup> From a conversation with Don Starry that Toffler quotes in Toffler, p.55.

Doctrinal debate within the U.S. Army preceded doctrinal debate with our NATO allies. Allies remained skeptical about American insistence to revise doctrine. There was a paralyzing reluctance to shift the doctrine from “preserving or restoring the territorial integrity of NATO” to “fighting and winning.”<sup>5</sup> Further, there was a deep seated suspicion among European allies that the American argument to revise doctrine was tied into the argument for standardization, which was widely interpreted as a pitch to “buy American.” In order for the United States to rely upon its allies to participate in an aggressive war of maneuver and initiative, it would need to perform the hard work at the strategic and operational level to bring them into the fold.<sup>6</sup>

Although the concepts were operational, they could not be removed from their strategic context. The strategic vision of the United States shifted from a theater focus on war in Europe to a global focus on crisis management in unpredictable quarters of the world.<sup>7</sup> The geographic uncertainty of a global strategy meant that a forward-based force structure must be transformed to one which could rapidly be moved anywhere in the world. Mobility became a linchpin of national strategy and, consequently, operational doctrine.<sup>8</sup> The emerging doctrine called for joint and combined operations, as did real world crises that required the use of force.<sup>9</sup> Another interesting aspect of the “Information Age” was becoming painfully apparent to strategic and operational leaders: as the media developed a near instantaneous ability to report events around the globe, strategic and operational authorities perceived the need to respond quickly and make decisions armed with instantaneous knowledge of tactical results. The boundaries between strategic policy, operational decision, and tactical action were blurring.

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<sup>5</sup> Airie Van der Vlis, “AirLand Battlein NATO, a European View.” Parameters, Summer 1984, pp. 10-14.

<sup>6</sup> In March 1976, Senator Sam Nunn of Georgia said, “What was once little more than an intriguing topic of cocktail party conversation has now become an issue upon whose resolution hangs NATO’s future viability as a collective security organization...the vast duplication and waste associated with purely national approaches to weapons procurement, logistics, doctrine, and tactics.” Sam Nunn, in Senate Hearings Before the Committee on Armed Services: European Defense Cooperation, 94<sup>th</sup> Congress, 2<sup>nd</sup> session, 1976, p. 36 as quoted by Edmund Daley, “Standardization or Bankruptcy for NATO.” Naval Institute Proceedings, November 1978, p.86.

<sup>7</sup> Global “crisis management” is meant as a distinction from global “containment,” a strategy which had never distracted American focus from Europe as the principle strategic theater of concern.

<sup>8</sup> The strategic significance of this doctrinal change was driven home with the establishment of the RDF during the Carter Administration.

## Maritime operations follow Army doctrine into the Information Age.

The dramatic doctrinal evolution occurring in the Army was not lost upon the other services, although the Navy may have been slowest to recognize a need to adapt in a changing world. Navy planners have notoriously been “platform-centric,” driven by technology change more than doctrine or theory. Rarely have they felt compelled to conduct thorough operational scrutiny of the Navy’s mission and way of doing business, preferring to adapt tactics to technological advances in the execution of classic maritime missions: sea control, power projection, presence. Mahan’s theories from the 1890’s were still prevalent in the Maritime Strategy of the 1980’s. As late as 1987, CNO Admiral Trost acknowledged that “modern life is changing so fast that any attempt to describe the Navy of the future would seem doomed to failure... (however) the distinguishing feature for the Navy of the future may well not be the differences in technology, but a surprising similarity in character to the Navy our country has always known.”<sup>10</sup> Although he recognized that the Navy would seek battle “higher, faster, farther, deeper,” global presence still meant more ships; and the United States Navy was firmly and resolutely headed to amass six hundred.

About that time a Navy iconoclast, Jerry O. Tuttle, believed, to the contrary, that reformatory change was in order. Accelerating technological advancements were just a tangible manifestation of a more profound change in the way society was thinking and acting. Civilian sectors of society were seizing initiative, and developing capabilities that were being ignored by Navy thinkers. If the Navy did not move swiftly it would be completely unprepared to provide security for this new society. The Navy should seize the initiative and exploit societal changes in maritime warfare. Forming conclusions very similar to Starry’s, Tuttle believed that mass was no longer the predominant principle of warfare. It was maneuver: initiative, speed, long range and precise firepower.

In his view, an obsolete, plodding Navy procurement system was working like mad to procure ships and systems designed to fight the last war. The proliferation of

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<sup>9</sup> The call for joint planning and execution had been going on since even before 1947. The point was again driven home after cumbersome joint operation in Grenada with the Goldwater-Nichols Act of 1986.

<sup>10</sup> Carlisle Trost, “Higher, Faster, Farther, Deeper. The United States Navy in the 21<sup>st</sup> Century.” Seapower, April 1987, p 7.

microcomputers and satellite communications capability in industry were not being exploited fast enough by Navy Research and Development managers, and certainly not by operational commanders. He resolved to show that it was time for the Navy to exploit all resources available, including commercial, open-source technology.

A brand new weapon system, the Tomahawk, promised to give extended range and precise targeting to virtually every ship afloat. This was a remarkable extension of strike capability that had been the exclusive domain of carriers and manned aircraft. It dramatically enhanced the Navy's ability to carry the battle to the enemy, to extend the strategic defensive perimeter far from American shores, and to extend the operational defensive perimeter far from the operational center of gravity: the aircraft carrier and the oiler.<sup>11</sup> The operational commander had to plan within a space that was an order of magnitude larger than his predecessor's.<sup>12</sup> Tuttle thought he had a solution, and in 1987 he aimed to prove it. Then serving as Chief of Staff of the Atlantic Fleet, he carved out an ad hoc cell within his staff, diverted funds from other projects, and directed his cell to outfit every ship in a departing battlegroup with personal computers and a means for them to communicate a "digital picture" with each other via a dedicated satellite net. This ad hoc system, JOTS,<sup>13</sup> became the genesis for an operational doctrine based on a near-real time common operational picture.

Meanwhile, from a doctrinal perspective, Navy awareness was reluctantly growing that future warfare would need to be fought jointly. Navy strategists began to perceive the inadequacies in the Maritime Strategy, which envisioned pushing the United States defensive perimeter as far away from the coast as possible. The probability of a deep-water, heavy mass battle at the opposite extreme of the Pacific or Atlantic seemed

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<sup>11</sup> When first introduced, Navy planners thought that the Tomahawk sea variant (TASM) would be the purview of the operational commander and the Tomahawk land variant (TLAM) would be a national strategic weapon. Thus operational doctrine focused more on TASM targeting, particularly on a function called Data Base Management. DBM constructed a maritime operational picture by deconflicting electronic information input from a multitude of sources. DBM was an intensive management effort to maintain a near-real time targeting picture on a theater-wide scale.

<sup>12</sup> The author recognizes that a battlegroup commander may be an operational commander in some situations and a tactical commander in other situations, but deems that is not pertinent to validity of this discussion at the operational level.

<sup>13</sup> JOTS stood for Joint Operational Tactical System, though Tuttle's personal cell joked that it stood for the Jerry O. Tuttle System. The first variants were patched together from commercially available computers and communications equipment, and were used to build a near real-time picture very similar to the Tomahawk missile system's DBM picture. It was relatively cheap, and a tremendous operational tool.

increasingly small. Navy planners realized a six hundred ship navy was no longer in the cards. Nor, perhaps, was one needed to support a strategy of global crisis management. It was time for serious work to match doctrine to strategy. How should the United States Navy establish a global presence? As concepts of rapid maneuver and deep projection came to the fore, U.S. Navy strategists discussed speed, maneuver and power projection in the maritime environment. By 1992 *From the Sea* (USN) became the centerpiece for naval doctrine. The Marine Corps doctrine, *Operational Maneuver from the Sea*, provided the lash-up to complete the naval force vision for conducting operations in support of American global strategy in the Information Age.

### What is Network Centric Warfare?

In January 1998, Vice Admiral Art Cebrowski published an article in the Naval Institute Proceedings,<sup>14</sup> which provoked heated debate in the fleet. It coined the term Network Centric Warfare, and postulated principles for maritime warfare in the Information Age. If it is a revolution in military affairs, he contends, the revolution has already occurred, at least in the United States. The most competitive powers driving the American economy and means of production, manufacturers, distributors and customers, have already modified their behavior to adjust to a changed reality. The decision cycle (the OODA loop)<sup>15</sup> has shrunk to a fraction of what it was in the Industrial Age. Power in the Information Age comes from speed and access to information. The competitor in business and in industry with the smallest and most accurate OODA loop succeeds. Cebrowski argues that the same principles pertain in warfare. Network Centric Warfare is already nascent, and it is just "the starting point for an emerging theory of war in the Information Age."<sup>16</sup>

Newton postulated that every action provokes an equal and opposite reaction. Similarly, doctrinal change invariably provokes recalcitrance. Skeptics ask, "What has changed? Are the missions the same? Is this debate smoke and mirrors, a façade to

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<sup>14</sup> Arthur Cebrowski, "Network Centric Warfare, It's Origin and Future." Naval Institute Proceedings, January 1998, pp.28-35.

<sup>15</sup> OODA: Observe, Orient, Decide and Act.

rationalize a smaller force structure? Does the equipment and weaponry we use today have relevance if we change the way we fight? If we change the way we fight, will we fight alone?"

Admiral Cebrowski argues that Network Centric warfare "is not about making our forces smaller, it is about making them better."<sup>17</sup> Power in the Information Age comes from the access and speed that are inherent in *an effective network in which each warfighter is a node*. The network is a power multiplier which provides the warrior with an increased awareness of the situation (friendly and adversary) so that *combined effort can be focused immediately, efficiently, and constructively toward operational objectives*. The network helps the operator drive his OODA loop towards zero. It grants him a tactical advantage in speed and focus, and an operational advantage to synchronize and sequence tactical action so as to dominate the adversary by controlling the tempo of the fight. That will be the determinant of victory in battle. "You can talk about precision strike, dominant maneuver, battlespace dominance, focused logistics. . . but you aren't going to be a success unless you have information superiority first."<sup>18</sup>

The underlying basis of Network Centric Warfare is human decision making and operational behavior; it is not equipment. There are, however, some *equipment enablers*: equipment we must put in the hands of skilled warfighters. Much of that equipment is already in the hands of operators, who excel at its tactical use. The leap of faith must come at the operational level, where *leadership must be poised to make decisions to exploit existing capabilities in new and imaginative ways, to reap quantum improvements in operational effectiveness*.

All very well and good at the theoretical level, argue tactical thinkers; but what does that mean in more pragmatic, more concrete terms? Rear Admiral Mike Mullen, the Director for Surface Warfare puts the discussion in less theoretical terms. "The concept we are pursuing," he writes, "is Network Centric Warfare" in providing, equipping and training for our core capabilities: land attack, theater air dominance, anti-submarine warfare, mine warfare, antisurface warfare, amphibious warfare, and combat logistics.

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<sup>16</sup> Arthur Cebrowski, "Network Centric Warfare." Lecture at Navy War College, Newport, Rhode Island 17 Dec 98.

<sup>17</sup> Ibid.

<sup>18</sup> Ibid.

The missions do not change, the way naval forces do business does. They already, today, have a significant network-centric capability and are already using it. The network plugs sensors and shooters into a single, accurate, integrated picture of the battlefield.<sup>19</sup> That picture can be exploited at all levels of warfare.

Today's warfighters in the maritime theater already use a Single Integrated Air Picture (SIAP), the product of fused, common, continuous, unambiguous tracks of all airborne objects in the surveillance area. Each object within the SIAP has one, and only one, track number and set of associated characteristics. It is the critical enabler that provides the war fighter the ability to perform effective, efficient and integrated theater air and missile defense. Aegis cruisers and destroyers, and airborne platforms already provide a near complete operational picture that can facilitate defense in depth and 360 degree coverage over friendly forces afloat and ashore. This will, one day, include a ballistic missile defense capability, to defend what Americans deem to be a critical vulnerability in the fight today. Information superiority, gained by fusing data from (existing and future) space-based sensors, long range sensor suites, theater and national systems, combined with long range precision ordnance will give air, surface, submarine, and amphibious platforms, operating independently or in a battlegroup, the ability to attack throughout the battle space.<sup>20</sup>

Classic maritime missions such as anti-submarine, sea control and anti-mine warfare are puzzle-building tasks that are best performed when cumulative data can be assembled from diverse array of sources into a consolidated and coherent "map of the battlefield." The strengths of diverse platforms can be integrated more effectively in an effective network. Naval forces already work to achieve a common operational picture in the real-world execution of these missions: a more mature network in the future will further enhance the ability to perform them quickly and decisively.

Power projection, or land attack, will be offensive, integrated, network centered, and sea based. Today we assign fire support units in a platform-centric manner. Tomorrow, longer range firepower will be allocated dynamically from a network based architecture. Any unit that is the "closest with the mostest" will receive the call for fire.

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<sup>19</sup> Mike Mullen, "Where Surface Warfare is Headed—and Why." Naval Institute Proceedings, October 1998, p. 76.

<sup>20</sup> Ibid.

Dynamic battle management will support precise and scaleable massed fires. Land attack will be executed at all levels of war (strategic, operational, and tactical) and at the lowest possible echelon. Troops will move directly from the sea to the operational objective ashore without a delay to obtain and defend a beachhead. The network will enhance speed, range, and lethal enablers for the power projection mission.

### **The Strategic Argument.**

U.S. National Security Strategy is premised on its intention to foster domestic strength and international leadership to advance the goals for a safer, more prosperous America. The President has defined three core objectives: to enhance American security with diplomacy and military readiness, to bolster American economic prosperity, and to promote democracy abroad. American competitiveness in a rapidly changing world will be enhanced with a global infrastructure as a matter of national priority.

*We will invest in a world-class infrastructure for the twenty-first century, including the national information and space infrastructure essential for our knowledge-based economy.<sup>21</sup>*

To foster regional efforts to promote peace and prosperity and to increase cooperation in confronting regional threats that defy unilateral solutions, we must always be prepared to act alone when we must, when that is our most advantageous course of action. But many of our security objectives are best achieved—or can only be achieved--through our alliances and other formal security structures.

*Durable relationships with allies and friendly nations are vital to our security. A central thrust of our strategy is to strengthen and adapt the security relationships we have with key nations around the world and create new relationships and structures when necessary.<sup>22</sup>*

Just as industrial infrastructure was a strategic assets for the Industrial Age, the “world class infrastructure for the twenty first century” will be a national asset, for the

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<sup>21</sup> The White House, National Security Strategy for a New Century, October 1998, p. 29.

security of the nation as well as its economic competitiveness, in the Information Age. The Chairman of the Joint Chiefs, in Joint Vision 2010, has translated the vision of the National Security Strategy into a Military Strategy that reflects how he believes war will be fought in the changed strategic environment of the Information Age:

*Forces harnessing the capabilities potentially available from this (integrated information) system of systems will gain dominant battlespace awareness, an interactive "picture" which will yield much more accurate assessments of friendly and enemy operations within the area of interest.<sup>23</sup>*

How should the armed forces shape the international environment? How will the armed forces prepare for future operations and respond to contingencies?

*Our history, strategy, and recent experience suggest that we will usually work in concert with our friends and allies in almost all operations... It is not enough just to be joint when conducting military operations. We must find the most effective methods for integrating and improving interoperability with allied and coalition partners. Although our Armed Forces will maintain decisive unilateral strength, we expect to work in concert with allied and coalition forces in nearly all of our future operations, and increasingly, our procedures, programs and planning must recognize this reality.<sup>24</sup>*

### **Interoperability with our allies. Push, pass, or plug in?**

It has become clear in the years since the Gulf War that the United States will be likely to fight future wars in unexpected regions with ad hoc coalition members. Anti-submarine warfare, anti-mine warfare, maritime interdiction operations are all maritime missions that have been performed by multinational forces in real-world operations since the Gulf War. To foster conditions for future success, regional CINC's have each developed a Theater Strategy of Engagement and Enlargement to move beyond language and cultural barriers, to expand operational contact, to cultivate interoperability, and to promote unity of effort. These strategies include aggressive programs for

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<sup>22</sup> National Security Strategy, 1998, p.2.

<sup>23</sup> Chairman of the Joint Chiefs, Joint Vision 2010, Pentagon, Washington, D.C., p.13.

<sup>24</sup> JV2010, pp. 4 and 9.

“military-to-military interactions,” international education programs, and multinational exercises.

The lessons learned from these exercises have been predictable: language difficulties, lack of common operational picture, SOP<sup>25</sup> differences, signaling and communication handicaps. In many cases, a concern for “losing face” has inhibited partners from frankly addressing operational miscues, technical difficulties, or even training shortfalls. Despite cultural sensitivities inherent in multinational operations, U.S. regional CINC’s and local commanders have improved in their ability to anticipate obstacles to operational success. Yet there remains a great deal of progress to be made.

Diverse capabilities can bring a lot of strength to a multinational maritime force. Multinational maritime warfare in the Information Age presents daunting challenges. Partner nations struggle to plan operations together, to communicate with each other, and to adapt to unexpected changes in the operational environment. Although conceivably within reach, partner nations lack a meaningful shared operational picture, from which they can work to surpass other obstacles to integrated multinational operations.

In many operations and exercises, ad hoc multinational forces have adapted NATO doctrine to facilitate communication, to signal and coordinate maneuver, and to direct operational effort. A strong liaison program has usually marked the difference between “success” and “failure” in achieving interoperability. Virtually all nations that participate in multinational exercises with American forces respect U.S. technological superiority and professional expertise, and most are willing to adapt insofar as they are able. But most regional CINC’s have come to understand that in most cases, multinational operations are in the “crawl before we walk” stage.

The Network Centric Warfare debate is still a new one in the American navy. It has barely been broached among our allies. A perusal of defense professional journals from a number of allied nations reveals sparse discussion of the topic, although it dominates American strategic and operational journals over the last two years.<sup>26</sup> Allied

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<sup>25</sup> SOP: Standard Operating Procedures

<sup>26</sup> The author perused the French Defense Nationale, the British RUSI Journal, the Italian Revista Maritima, NATO’s Sixteen Nations, and the Asian Defense Journal, and interviewed a number of senior international students at the Naval War College. Only three articles on Information Age technologies and warfare have been published in the French journal in the last three years. Two articles on RMA have appeared in the Asian Defense Journal. In the British journal, there is somewhat more discussion, although not a great

navies seem to lack an understanding of value added by a mature operational network.<sup>27</sup> Many, perhaps most, nations have exploited the end of the Cold War to reduce defense expenditures and invest their “peace dividend” in economic growth. It is possible, of course, that allied leaders are driven by pragmatic priorities. They may perceive that enabling technologies are fiscally out of reach, that it is not worth chasing a dream when there are plenty of hard realities they can make progress on. Those scarce resources that are dedicated to defense expenditures are for the most part being allocated to more “guns, butter, and black oil.”

The use of information technology is far more extensive in U.S. forces than in any other nation. The quality of U.S. precision guided munitions and C4ISR, already impressive during the Gulf War, has continued to progress at an astonishing rate. The United States is harnessing key information technologies (microelectronics, data networking, software programming) to create a networked force which exploits weapons capable of pinpoint accuracy and extended ranges, and which integrates data from all-seeing sensors, managed by intelligent command *nodes* at all levels of war. Even the most technologically advanced allied nations, meanwhile, still have not achieved the level of technological sophistication and integration that the United States demonstrated in the Gulf War.

The European allies in NATO, for example, spend about \$160 billion per year on defense, with which they maintain 2.5 million men under arms and an array of high-performance weapons and platforms. But they spend much less than the United States.<sup>28</sup> They sustain, but do not envision radical change in the revised atmosphere post-Cold War.<sup>29</sup> They have been, in short, quite adequately preparing for the last war.

The United States finds itself in the position of pursuing a procurement program to fulfill a *uniquely American strategic vision*; creating a chasm between the capabilities

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deal. The author attributes the moderate prevalence of this discussion in British journals to the “special relationship” that British and American policy makers and planners pursue. Virtually nothing appears in the other two journals. International students at the Naval War College confirm the author’s conclusion that the debate has not yet grabbed the interest of leaders in their navies.

<sup>27</sup> “It is telling,” remarked a French officer, “that the entire French Navy has only one internet address.... Young French naval officers who are interested must access the internet at home.”

<sup>28</sup> The United States spends about \$42 billion on procurement and \$24 billion on R&D. European allies spend approximately \$30 billion on procurement and \$8 billion on R&D. David Gompert, Richard Kugler, Martin Libicki, Mind the Gap, Washington, D.C.: National Defense University Press, 1999, pp.9 and 39.

<sup>29</sup> Gompert, p. 9.

American forces bring to the theater and those of regional allies. Hence, the United States is becoming increasingly unable to conduct coalition operations, and interoperability is becoming a remote memory.

There is a distinct risk that, as it becomes increasingly difficult to operate with allies, the United States may well find that it operates more effectively unilaterally, and hence may choose to do so. Similarly, allies may be daunted by the defense expenditures they see the United States dispense. Growing American capability may lead allied powers to believe that they do not need to work hard, or spend much, to participate in coalition operations, and leave the United States to operate unilaterally. The result is a vicious circle. Since the United States feels it can't rely on its allies, it may choose to fight alone, and since the allies perceive they are not needed, they are off the hook for heavy defense expenditures, and free to pursue their own agenda. Former Secretary of Defense John White describes this illustratively:

*"This dynamic is pernicious. The absence of a common vision and complementary capability invites the Europeans to take the short-sighted view that curbing Saddam Hussein's violations is a problem for the United States while they remain free to buy his oil. It reduces and erodes the effectiveness of the (NATO) alliance in dealing with other issues of mutual interest. A willingness on the part of the United States to stand alone would reflect an illusory strength. It would allow our allies to support us when it suits them and to look to us to implement some of their goals (e.g. counter-terrorism) while they are free to achieve other objectives (e.g. trading with Iran.)"<sup>30</sup>*

Even worse, increased unilateral action could cast the United States in the role of global "bad cop," ready to use force when others are more inclined to seek peaceful means of conflict resolution. As a consequence the United States could become the most likely target for terrorism and other threats by rogue states and groups. This would test American public willingness to bear the burden as guardian of international stability.<sup>31</sup>

There is much more at stake than a technological gap: it is a strategic and operational issue. As important as the hardware is, the real RMA<sup>32</sup> resides in the innovative doctrine, tactics, training and organization that must accompany it to transform military operations in the Information Age. The most technologically

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<sup>30</sup> Former Deputy Secretary of Defense John White in the introduction to Gompert, p. xi.

<sup>31</sup> Gompert, p.7.

<sup>32</sup> RMA: Revolution in Military Affairs.

advanced allies do not perceive the strategic need to protect distant interests and defeat distant threats. Exploiting information technology may be provocative, interesting, perhaps even desirable; but there is absolutely no consensus that it is imperative. There is no eagerness to dive into this RMA. In fact, there is widespread skepticism. Generally speaking, it is viewed as an American phenomenon, and American efforts to encourage standardization are taken as more evidence of traditional American chauvinism. It is stretching things to say that the allies share a vision for the future. The growing gap is, ergo, strategic, operational, and technological.

As American capability for Information Age warfare progresses, the interoperability chasm will grow. If coalition operations are to remain the “central thrust of American strategy,” limited options appear to present themselves. The United States can (1) pull: slow its technological development enough to maintain interoperability with future coalition partners and encourage continued progress. Alternatively, the United States can (2) pass: continue rapid progress and encourage future allies to keep up as best they are able. Lastly, the United States can (3) make interoperability a priority in our procurement plans and operational doctrine by insisting upon a “plug-in” capability, so that American maritime forces can integrate future allies in operations as they prove operationally ready.

The first proposal (Pull) is undesirable, even frightening. Should the United States slow its progress, it may risk stalling. Paralysis may give impetus to nay-sayers, worriers, bean counters and backward thinkers. This would be particularly the case if a policy to promote interoperability over forward-looking doctrine were imposed at the strategic level. A strategy to share American systems and information falls short of the mark, as technical compatibility alone will not compensate for operational shortcomings. Further, regional allies will undoubtedly be reluctant to slave their operational capabilities to American systems (or to American manufacturers). The United States may well find itself with the reduced force structure anticipated for network centric dispersed forces, lacking network centric enhancements needed to prevail over the adversary. Reduced mass becomes a critical vulnerability when lacking dominant maneuver, range or lethality.

A choice to continue technological and operational development at its own pace (Pass) is the easiest course of action to follow, and one the United States risks falling into if it remains lethargic about setting a mid-course correction in current R&D and procurement programs. American forces may find themselves at a critical point in the future choosing to operate unilaterally, because it is easier, quicker and more effective, and operations with non-networked allies would expose critical vulnerabilities to the adversary. This could undermine American national security strategic objectives. Further, what are the chances that a “global Goliath” may face a “regional David” that can exploit vulnerabilities that American forces have not perceived?

A theater strategy to parcel out zones to non-networked allied forces is likewise heavy with risk. At the operational level, a “zone defense” virtually invites adversaries to exploit vulnerabilities to “outflank” American units and creates an operating environment in which our allies could perceive they are deemed the “second team.” Unity of effort in such an environment may be compromised. At the strategic level, the political consequences of implying our allies are second-team, or denying our allies’ participation in the main action could undermine the policy success, no matter the operational results.

Clearly, some plan to share an information network with coalition partners is desirable, though it is not without challenges and risks. The main challenge is *security*. Information access has traditionally been well guarded and stove-piped. Every nation has developed elaborate security mechanisms to control and limit access to strategic, operational and tactical information. The fundamental principle of network centric warfare, open and unimpeded access to the operational picture, appears to violate security lessons learned through hundreds of years of experience. Granting access to a shared operational picture may enhance operations, but it exposes opportunity for access to strategic or sensitive information as well. U.S. Navy planners find their efforts to build a multinational operational-level network being thwarted by national security organizations, who seek to build national stovepipes and firewalls that are at cross purposes to the operational commander.<sup>33</sup> These obstacles will not easily be overcome,

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<sup>33</sup> In January 1999, an American battlegroup commander embarked in USS Carl Vinson, and a British admiral embarked in HMS Invincible approached within sight of each other in the Indian Ocean and attempted a video teleconference. In order to link these two admirals, each ship established satellite links to their respective national communications centers in Norfolk, Virginia, and Northwood, U.K. The

but it is not productive to "live with it." This may be the hardest technical nut to crack right now, and strategic level planners must work with national agencies to come to some resolution for this. But the security obstacle will not matter much if the United States is unable to foster an interest amongst its allies to "join the net" in the first place.

A second daunting challenge to network centered multinational operations entails stimulating the interest of regional partners. The way ahead must be both technical and operational. U.S. maritime forces should work towards interoperability, and in doing so foster allied demand for the technology enhancers as they approach the "walk" or "run" stage of interoperability. Demand will be most effective if it is driven from the bottom up, although strategic level conceptual constructs can provide a policy framework to stimulate demand. At the strategic level, the best course of action is to "carve out a slice of the net" and "plug in" allies as they become ready. American forces can continue their rapid progress towards warfighting readiness in the Information Age, yet work with allies toward the same goal at their allies' respective cadences.

The Naval Warfare Development Center can do strategic level hard work in developing conceptual solutions for multinational interoperation in network centric warfare; but the operational level hard work will be performed by the regional CINC's. The regional CINC's can best identify our most likely regional partners for future contingencies and promote mutual operations. In operations and exercises, CINC's are best suited to identify technological and operational gaps, and develop solutions to resolve them. CINC's develop Theater Engagement Plans that support, within their regions, the National Military Strategy. They impact the Navy procurement plan as they submit, annually, their Integrated Priority Lists. Their insistence on a "plug-in capability" for future allies is a mechanism for a bottom up demand upon manufacturers and national agencies. With the proper technological decisions, allies will not find themselves coerced to "buy American."<sup>34</sup>

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national communications centers scrambled their respective headquarters staffs in an extraordinarily energetic bid to establish a communications link between the national communications stovepipes. They succeeded within hours. The two ships, literally within hundreds of yards of each other, exploited disparate networks of satellites that spanned the globe and waited hours to perform a vital operational function. This cumbersome process would have been even more labored and perhaps impossible with friendly ships that were not NATO allies.

<sup>34</sup> In an interesting Information Age paradigm shift, Americans can build a better path to the mousetrap, rather than building a better mousetrap.

Many allies have not yet come to appreciate the value gained from a paradigm shift in the Information Age. CINC's are the most ideally suited agents of change, but their plates are too full with real-world contingencies to add a doctrinal road show to their agenda. Door to door salesmanship is unlikely to make great inroads in persuading military leaders to dramatically shift their way of doing business, in any event. As Don Starry likely observed, a generation of leadership may have to pass. But there is a unique opportunity to bring Mohammed to the mountain.

CINC's already promote an international education program within their Theater Engagement Plans. Key allies, and CINC's can identify who those are, should be encouraged to send representatives to the Navy Warfare Development Center. Having completed a course of study at the Navy War College, a select group of highly talented and very promising future allied military leaders can participate in the Fleet Battle Experiment program, and observe American doctrine at first hand. These young officers will know how to judge the value of our doctrine and its relevance to the way their navies operate. They will know how best to brief their leadership, to foster understanding and stimulate demand. American planners may benefit from perspectives on improving multinational exercises.

Above all, with this RMA in particular, worth cannot be measured in "the number of toys you bring to the game." Worth must be measured by operability and interoperability: the integration of respective strengths adding value to the combined force. Increased tempo of operations and exercises are the best means to foster integration. So often this is where budget cuts are demanded, but CINC's can best make the argument that we progress beyond the "walk before we run" stage, in order to train the way they will fight. Regional allies will increasingly add value to U.S. operations, and lessons learned will undoubtedly stimulate an appetite for equipment enablers and increased interoperability among regional partners.

### **Conclusion.**

Network Centric Warfare is clearly an emergent doctrine that the United States Navy has identified as the way to conduct future maritime operations in support of

national and theater objectives in the Information Age. Network Centric Warfare has evolved from a uniquely American doctrine, yet it has universal pertinence. It is based on concepts that have made American industry and American business the most competitive in the world, and its tenets are as applicable in warfare as they are in business. But there is a gaping mismatch between the application of this emerging operational doctrine and the strategy it will be tasked to support. Specifically, it is widening an interoperability chasm between American and allied forces who may fight alongside each other in the future. As it is a largely American conception for warfare, the United States bears the burden to pursue interoperability with regional coalition partners if it is to fight “together when we can, alone if we must.”<sup>35</sup>

Several options present themselves as the “way ahead” to match operational doctrine to strategy. First, the United States can (1) pull: slow its technological development to maintain parity with future coalition partners. Alternatively, the United States can (2) pass: continue rapid progress and encourage future allies to keep up as best they are able. Lastly, the United States can (3) continue its own rapid progress, but choose to share technologies and make “plug-in” interoperability a priority in its procurement plans and operational doctrine. Having made provision to “plug-in” allies, the United States can choose to operate with future regional partners when they prove operationally ready to integrate with American maritime forces.

Technological development will produce key equipment and system enablers to carry out a network-centric doctrine, but technology is not optimized if it is not placed in the hands of trained, interoperable warriors. Regional CINC’s must systematically work to identify key regional partners and accelerate the pace toward interoperability. By demanding a “plug-in” capability and an effective liaison program, American forces can show our partners the advantages of coalition interoperability in a network centric environment. This in turn should stimulate a bottom-up demand to rapidly progress beyond the “walk” stage in coalition operations, and best set conditions for success.

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<sup>35</sup> National Security Strategy, May 1997, p.1.

## Bibliography

### **The Navy Debate:**

Barnes, Frederick, "Hollow Dollars; Hollow Defenses." Defense & Foreign Affairs Strategic Policy, February 1999, p.16.

Barnett, Thomas, "The Seven Deadly Sins of Network-Centric Warfare." Naval Institute Proceedings, January 1999, pp.36-39.

Cebrowski, Arthur, and John Garstka, "Network Centric Warfare: Its Origin and Future." Naval Institute Proceedings, January 1998, pp. 28-35.

Cebrowski, Arthur, "Network Centric Warfare." Speech delivered at Navy War College, Newport, Rhode Island, 17 December 1998.

Chesky, Jay "Network Centric Warfare and Information Technology for the 21<sup>st</sup> Century." Presentation given at Navy War College, 8 April 1999.

Fitzgerald, James, and Raymond Christian, Robert Manke "Network Centric Antisubmarine Warfare." Naval Institute Proceedings, September 1998, pp.92-95.

Hoffman, F.G., "Innovation Can Be Messy." Naval Institute Proceedings, January 1998, pp. 46-50.

Holland, W.J., "Nuclear Weapons in the Information Age: Who Needs 'em?" Naval Institute Proceeding, pp. 45-47.

Loescher, Michael S., "Moving the Navy into the Information Age." Naval Institute Proceedings, January 1999, pp. 40-44.

Mullen, Mike, "Where Surface Warfare Is Headed—and Why." Naval Institute Proceedings, October 1998, pp. 76-79.

Nutwell, Robert "IT-21 Intranet Provides Big Reachbacks." Naval Institute Proceedings, January 1998, pp. 36-38.

Prina, Edgar, "A Constellation of Capabilities." Seapower, February 1987, pp.7-15.

"U.S. Navy Review" Jane's Defense Weekly, 24 March 1999, pp. 23-26.

### **The Origins of Information Age Warfare:**

Atkeson, Edward, "Is the Soviet Army Obsolete?" Army, May 1974, pp.10-16.

Needham, Bruce, "Landsat: A Routine Problem-Solving Tool for Naval Officers." Naval Institute Proceedings, August 1978, pp. 94-97.

"Seaside Sonata: Interview with Vice Admiral Jerry O. Tuttle." Seapower, August 1993, pp.9-13.

Shelton, Henry "Translating Concepts into Capabilities." Naval Institute Proceedings, September 1998, p. 29.

Starry, Donn, "Focus is Central Battle." Army, October 1978, pp.30-33.

Toffler, Alvin and Heidi, War and Anti-War. New York: Warner Books, 1993.

Trost, Carlisle, "Higher, Faster, Farther, Deeper: the U.S. Navy in the 21<sup>st</sup> Century." Seapower, April 1987, pp. 6-19.

#### **Multinational Operations:**

Berry, Charles, "NATO's Combined Joint Task Forces in Theory and Practice." Survival, Spring 1996, pp.81-97.

Bond, William, "Interview with the Director of the US Army Digitization Office." Jane's Defense Weekly, 26 August 1998, p. 32.

Chairman of the Joint Chiefs of Staff, Joint Vision 2010. Pentagon, Washington, D.C.

Daley, Edmund, "Standardization or Bankruptcy for NATO." Naval Institute Proceedings, November 1978, pp. 79-87.

Gompert, David C., Richard Kugler, and Martin C. Libicki, Mind the Gap. Washington, D.C.: National Defense University Press, 1999.

Nutwell, Robert "Advances in Technology: the Impact on Multinational Operations." RUSI Journal, December 1997, pp. 27-30.

Pudas, Terry, "Preparing Future Coalition Commanders." Joint Forces Quarterly, Winter 1993/94, pp. 40-46.

Rice, Anthony, "Command and Control: The Essence of Coalition Warfare." Parameters, Spring 1997, pp. 152-167.

Sanderson, J.M., "Dabbling in War: the Dilemma of the Use of Force in United Nations Intervention." In Peacemaking and Peacekeeping for the New Century, edited by Olara Otunnu and Michael Doyle. Lanham, Maryland: Rowman & Littlefield Publishers, 1998.

The White House, A National Security Strategy for a New Century. Washington, D.C., October 1998.

The White House, A National Security Strategy for a New Century. Washington, D.C., May 1997.

Vittori, Jay, "Making the Case for Multinational Military Doctrine." Joint Forces Quarterly, Spring 1998, pp.109-115.

#### **Foreign Sources and the Allied Debate:**

Bellais, Renaud, "Technologie Militaire et Systeme d'Information de Defense." Defense Nationale, Janvier 1998.

Bir, Cevic, General, Turkish Army "Interoperability and Intervention Operations." RUSI Journal, December 1997, pp. 22-26.

"Commanders of the World's Navies Respond." Naval Institute Proceedings, March 1999, pp. 26-39.

De LaMoriciere, Julien, "Les Enjeux de l'Interoperabilite." Defense Nationale, Fevrier 1999.

Dipankar, Banerjee, "Security Issues. RMA: Impact and consequences for the Asia Pacific Region." Asian Defence Journal, March 99, pp.6-10.

"Euronaval Developments Emphasize Aiming, Flat-Screen Displays." Naval Institute Proceedings, January 1999, p. 108.

Fry, Robert Alan, Brigadier, Royal Marines, "End of the Continental Century." Naval Institute Proceedings, March 1999, pp.40-43.

Lok, Joris Janssen, "Joint Exercise Exposes NATO's C4I Gap." Jane's International Defense Review, April 1999, pp.61-62.

"Offboard Sonar Charts a Fresh Course for ASW." Jane's Navy International, March 1999, pp. 18-25.

Ravier, Eric, "Information et Nouvel Echelon Strategique." Defense Nationale, Novembre 1997.

Robins, Bill, Major General, Royal Army "Information Age Operations." RUSI Journal, June 1997, pp. 37-41.

Robins, Bill, Major General, Royal Army "Implications of Information Age Operations." RUSI Journal, October 1997, pp. 32-39.

Van der Vlis, Arie, "AirLand Battle in NATO, A European View." Parameters, Summer 1984, pp.10-14.

**Also consulted:**

NATO's Sixteen Nations (Monthly NATO Defense Review focusing on defense readiness of member nations.)

Revista Marittima (Monthly Italian Naval Review focusing on all aspects of seapower.)